Space Weather Forecast

Issued on Friday, 02 August 2024 at 01:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Occasional Moderate flares expected, chance of Strong flares and of exceeding S1/Minor Radiation Storm threshold. Potential further Coronal Mass Ejection blows Days 1-2 (01-02 Aug), chance of G1-G2/Minor-Moderate Geomagnetic Storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate, with occasional Moderate class flares observed from across the disc. A highly active disc with fourteen sunspot regions. AR3768 in the far southwest continues be active providing the largest flare activity. It is becoming increasingly difficult to assess as it nears the limb. AR3765, AR3766 and AR3767 persist as a cluster of spots in the southwest disc, with AR3765 and AR3767 in particular in very close proximity. AR3770 to the north of the previously mentioned regions also persists, although the flare activity from this region has been generally more muted. AR3772 in the southeast remains highly active, giving the second largest flare of the period. The assessment of AR3774 near the east limb is still constrained by the viewing angle, so this classification may change.

Analysis and modeling of a broad Coronal Mass Ejections (CMEs) associated with the largest flare from AR3768 in the far west of the disk continues, with this feature perhaps having some Earth directed component. A fast CME was also observed associated with a large flare from AR3772 in the southeast, we await model output but given the region's location a significant Earth-directed component is unlikely.

Solar Wind / Geomagnetic Activity: The solar wind was mostly at slightly elevated levels between 400-450km/s, under continued weak CME influence. The Interplanetary Magnetic Field, Bt, was generally moderate, falling weak at times. The north-south component, Bz, initially varied moderately, but became weakly to moderately positive from around 01/0700UTC. Geomagnetic activity was generally Unsettled (Kp3), with a G1/Minor Storm (Kp5) interval observed at 01/0000-0300 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity forecast to continue, with occasional Moderate class flares expected and a chance of isolated Strong flares.

Solar Wind /Geomagnetic Activity: Current CME influence is ongoing, but with limited impact so far. Further CME arrivals are then possible on Days 1-2 (02-03 Aug). They are both low confidence, but glancing blows are possible on both days. Furthermore, due to the number of coincident CMEs, further arrivals cannot be ruled out through the period.

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No recurrent fast wind enhancements are expected during the period, with CME arrivals expected to be the main factor of interest. Geomagnetic activity is expected to be generally Quiet to Unsettled, with periods of Active conditions likely and a persistent chance of G1-G2/Minor-Moderate Geomagnetic Storms should any CME arrivals bring more than a glancing blow. In the absence of further CME influence, activity is likely to become mostly Quiet later in the period.

Energetic Particles / Solar Radiation: Solar radiation is currently at background levels, but with a chance of exceeding the S1/Minor Solar Radiation Storm level in response to larger flares from the western disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	25	30	30	25
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	90	90	80	70
Very Active	R3 to R5 X	No	30	30	25	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	30	30	25	20
Very Active	≥ S3 *	No	5	5	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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